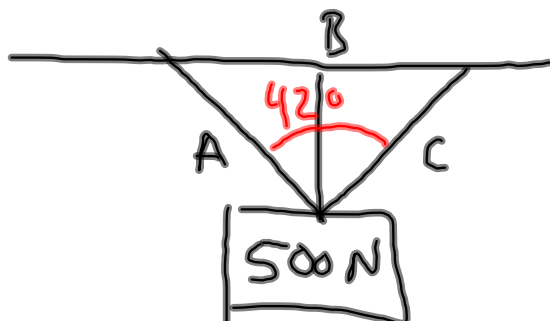
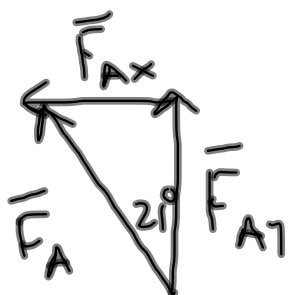


## Hanging Object and Ramp Practice Problems 3.28.12 Honors Physics

A sign is hung by three ropes as seen in the figure below. The angle between ropes A and C is  $42.0^\circ$ , and line B bisects the angle. Find the force on ropes A and B.



$$F_{Ay} = F_B = F_{Cy} = \frac{500 \text{ N}}{3} = 166.7 \text{ N}$$



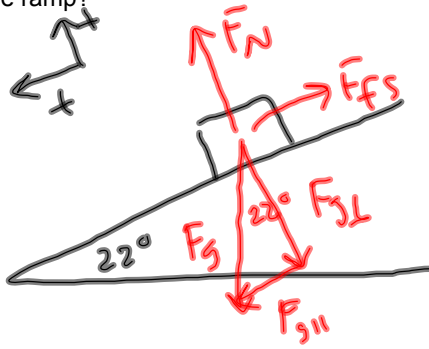
$$\cos(21^\circ) = \frac{F_{Ay}}{F_A}$$

$$F_A = \frac{F_{Ay}}{\cos(21^\circ)}$$

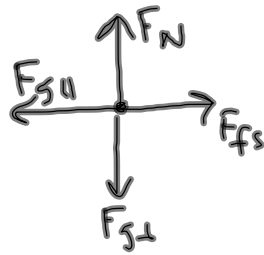
$$= 178 \text{ N}$$

## Hanging Object and Ramp Practice Problems 3.28.12 Honors Physics

A 5.5 kg suitcase is at rest on a ramp that is angled 22.0 degrees above the horizontal. What is the coefficient of friction between the suitcase and the surface of the ramp?



Equilibrium in both parallel and perpendicular directions



$$\sum F_{||} = 0$$

$$F_{g||} - F_{fs} = 0$$

$$\mu_s = \frac{F_{fs}}{F_N}$$

$$= \frac{20.19 \text{ N}}{49.98 \text{ N}}$$

$$F_{fs} = F_{g||}$$

$$= F_g \sin(22^\circ)$$

$$= mg \sin(22^\circ)$$

$$= 20.19 \text{ N}$$

$$= 0.404$$

$$\sum F_{\perp} = 0$$

$$F_N - F_{g\perp} = 0$$

$$F_N = F_{g\perp}$$

$$= F_g \cos(22^\circ)$$

$$= 49.98 \text{ N}$$